

"Uranometria," but we find it in the catalogue to Heis's Atlas as a 67. In the excellent chart of the seventh hour of R.A., by Fellöcker of Kremsmünster, forming one of the series prepared under the auspices of the Berlin Academy of Sciences, we find it marked only of 8.9 magnitude. There is consequently sufficient evidence upon record to justify the appearance of this star in our catalogues of suspected variables, even if it be not considered decisive as to variability. Yet the object seems to have been generally overlooked of late years. We are nevertheless able to state that in 1873 and 1874 small fluctuations of brightness could be detected, and may recommend it to the attention of observers who are more especially interested in the variable stars. The position for the commencement of the present year is in right ascension, 7h. 23m. os., and polar distance, $91^{\circ} 39'$. A star of 9.10 magnitude precedes it about 4 seconds in R.A., and about $1'$ north. The colour is a full yellow or light orange.

(2). *Mira Ceti*, according to the formula of sines in the last catalogue of variable stars, issued by Prof. Schönfeld, will attain its maximum in the present year on February 24. The minimum determined in the manner adopted by this eminent authority will fall on September 30. The first maximum of 1876 is on January 17.

(3). β Cygni was indicated as variable by J. Klein, of Cologne, from a series of careful observations by himself, between July 1862 and November 1863, and Schönfeld includes the star in a provisional list prefixed to his catalogue of 1875, ascribing a variation between 3.3 and 3.9 mag. to the brighter component of this beautiful object. It is not the first time that variability has been suspected in one component only of a double star. We are able to state that last August, β Cygni, as a naked-eye object, certainly looked dimmer than we had often remarked it.

THE ZODIACAL LIGHT has presented itself on each clear evening since our last, but most conspicuously on the 31st ult. It was then distinctly traceable to π Arietis, and at best views a fainter offset appeared to extend very nearly to the Pleiades. The axis passed a few degrees south of λ Piscium. The intensity of light was certainly more than twice that of the Galaxy in its brightest part between the constellations Cassiopea and Cygnus.

ENCKE'S COMET.—The re-discovery of this body is not yet announced, but it will be strange if it is not detected with the larger telescopes before moonlight interferes in the evening. In 1842, when the perihelion passage occurred at the same time as in the present year, it was observed with the Berlin 9-inch refractor on Feb. 8th; much more effective instruments, however, are now common, and if the comet's constitution has remained unchanged, we might have expected observations in January.

HALLEY'S COMET.—In our "Astronomical Column," next week, we shall give the principal results of the late M. de Pontécoulant's calculation of the perturbations of this comet (so interesting, especially to English astronomers) during the actual revolution, and describe the path in the heavens which his work indicates for the year 1910.

ANNUAL REPORT OF THE WARDEN OF THE STANDARDS

THERE has been just issued by the Queen's printers the Eighth Annual Report of the Warden of the Standards, Mr. H. W. Chisholm, on the proceedings and business of the Standards Department of the Board of Trade.

When we remind our readers that the Standards deposited in that department have been the result of the labours of many men of science, including Davies Gilbert,

Wollaston, T. Young, Kater, Baily, Sir J. Herschel, Earl of Rosse, Lord Wrottesley, Sir E. Sabine, and lastly, but most of all, W. H. Miller and the present Astronomer Royal, we need scarcely say there should be much in this Annual Report worthy of our notice. We confine our notice here to that part of the business of this department which is most likely to interest our readers, without referring to its various official or State duties.

One part of the business of this department appears to be the conducting of comparisons and other operations with standards of length, weight, or capacity, in aid of scientific researches or otherwise. Amongst such comparisons we note the determination of the lengths of two Russian pendulums for use in the Great Trigonometrical Survey of India, in ascertaining by combined astronomical and telegraphic observations the exact position of a number of fixed points on the earth's surface. Standards were also verified for the Governments of Canada and India, for special use.

Chemists and physicists are glad to rely on the accuracy of their measures or weights, as compared with our own or foreign standards, and to be assured of the constancy of the units employed in their researches. This part of the business of the Standards Department would appear therefore to be of practical use to those whose researches require such accuracy. To maintain uniform the weights and measures of our laboratories is not only aiding individual research, but facilitating the exchange of scientific experience.

Many additional instruments are stated to have been added to the valuable collection of comparing apparatus deposited in this department: one of these is the new powerful air-pump, by Deleuil, to be attached to a vacuum balance. During the preparation of new gold and silver standard trial-plates, elaborate experiments were made by the chemist of the Royal Mint, on gold and silver alloys, reference to which is made in the special Report of the Warden of the Standards appended to the Report. These experiments are referred to more particularly in the paper by J. Norman Lockyer, F.R.S., and W. Chandler Roberts, read before the Royal Society on Nov. 20, 1873, on the quantitative analysis of certain alloys by means of the spectroscope.

Attention is called in this Report to the teaching of weights and measures in schools. There is no doubt that a large number of obsolete and unnecessary weights and measures are used in school text-books. The teaching of the metric system of weights and measures is now abandoned in schools under the authority of the Education Department.

The use of the mirror and electric lamp has been so eloquently demonstrated by Professor Tyndall, that our readers will be glad to see appended to the Report a paper on the employment of a mirror and a ray of light for indicating differences in standard weights, or in measures of length. This paper is a translation of a paper by C. A. Steinheil, read in 1867 at the Imperial Academy of Sciences at Vienna, and is a valuable record of the work of one who spent his life in scientific research.

Also appended to this Report is a short table for the reduction to 0° C. of readings of barometers with metric graduations on their glass tubes, based on those coefficients of the expansion of mercury and glass adopted in standard measurements, viz. :—

Cubic expansion of mercury . . 0.00017971 for 1° C.
Linear expansion of glass . . 0.00000886 "

As an instance of the precision with which measurements are now made, we may refer to p. 40 of this Report, from which it appears that the value of a micrometer was determined at two different periods to be 0.00003181 and 0.00003183 inch respectively; showing a difference of only 0.00000002 inch. Such precision may appear to be scarcely necessary except in particular researches. As, however, any error in the production of a direct copy of

a standard is many times repeated and multiplied in the production of a weight or measure even for laboratory use, such precision is absolutely necessary in the original standards. For this reason all who value precision in their researches should take care that at least their units of measurement have been directly compared with the standards.

SCHREIBER'S EUROPEAN HERPETOLOGY*

THIS volume, issued by the publishers of Blasius's well-known work on European Mammals, and illustrated in nearly the same fashion, with numerous excellent woodcuts, will be very welcome to naturalists, as supplying in a compendious form an account of an important section of the Vertebrates of our Continent, on which there has hitherto been no generally recognised authority. In England, it is true, we have Bell's "British Reptiles," if it is not out of print. But as regards the lower forms of terrestrial vertebrates, Dame Nature has, we know, treated the British Islands rather scurvily. The fact is, these cold-blooded animals cannot stand a continuously low temperature, and the ice-sheet which so recently enveloped us must have destroyed all traces of reptilian and amphibian life, so that we have only what has been received from the Continent subsequently to the "Great Ice Age." And this is the reason of our scanty allowance. Europe generally, as we shall see from Dr. Schreiber's pages, is much more liberally furnished with representatives of these two orders of vertebrates.

Dr. Schreiber commences his work with an account of the European Amphibians, which naturally fall under the two sections *Urodela* and *Anura*. Of the Urodeles, or Tailed Amphibians, two families are recognised, one containing only the abnormal form *Proteus*, the other the Salamanders, which are divided into seven genera, containing altogether fifteen European species. The tailless division of the order, which comprehends the frogs and their allies, is not quite so numerous, only twelve species being recognised as European, which are assigned to eight genera. The account of these animals is followed by a very interesting chapter on their distribution, accompanied by many illustrations of it in a tabular form. Genera and species of Amphibians are alike most abundant in the south. While England only has eight species belonging to three genera, Germany has fifteen belonging to eight, and France twenty-one distributed amongst nine genera.

The second and larger division of Dr. Schreiber's work treats of European reptiles, beginning with the Snakes and proceeding through the series of Saurians to the few European representatives of the order of Chelonians. As in the former section, each species is well described, and particulars are given as to its distribution and habits. The variations in form and colour, which in some of the lizards and snakes are very numerous, are likewise given, and the mean seems to have been preserved between recognising too many species on the one hand, and allowing too few on the other. Altogether, twenty-four snakes, thirty-five lizards, and five tortoises (sixty-four reptiles in all) are treated of as occurring within the limits of the Continent of Europe. A full treatise on the range and distribution of these sixty-four animals is appended to this portion of the volume, which is concluded with remarks upon the collection, preparation, and transmission of specimens of these animals. On the whole, we can cordially recommend Dr. Schreiber's work as an excellent handbook and work of reference for those who are interested in this branch of natural history.

* Herpetologia Europæa, eine Systematische Bearbeitung der Amphibien und Reptilien welche bisher in Europa aufgefunden sind. Von Dr. Egid Schreiber, Director an der Oberrealschule zu Görz. Braunschweig, F. Vieweg und Sohn, 1875. 1 vol. 8vo., 640 pp., and numerous woodcuts.

BOTANY IN QUEENSLAND

IN his last report on the Brisbane Botanic Gardens, Mr. Walter Hill, the director, gives some interesting details on the progress of the garden, and more especially with regard to his trip to the Bellenden Kerr range, on the north-east coast of Queensland, in November last. Looking at the garden in a utilitarian point of view, rather than as a place of recreation and enjoyment—for which purposes, however, it is largely patronised—we find that the experimental department still continues to prove its utility in the introduction and distribution of plants yielding products of commercial value; frequent application is made for plants yielding fibres, medicinal products, dyes, &c.; more especially among this group of plants are applications made for indigo for the planters upon the northern rivers. Mr. Hill thinks that the growth and manufacture of indigo will probably assume the proportions of valuable and important interest in the tropical regions of the colony, whenever labour can be obtained at a sufficiently cheap rate. The experimental coffee plantation has proved very satisfactory during the past year, and the demand for sugar-cane continues, trials in its cultivation having succeeded in several previously untried localities. Amongst other economic plants distributed for experimental cultivation in Queensland may be mentioned the olive, tea, palm oil, lavender, senna, medicinal rhubarb, cocoa, clove, cinnamon, nutmeg, vanilla, ginger, &c. That trials in the acclimatisation of many of these valuable economic plants are intended in earnest will be understood from the following extract from the report. Mr. Hill says: "I would beg to call attention to the expediency of setting apart 400 acres upon both the Johnstone and the Daintree rivers, these districts offering better advantages as regards aspect and soil than the reserve at Cardwell possesses for the cultivation of the Clove (*Caryophyllus aromaticus*), the Nutmeg (*Myristica moschata*), the Vanilla (*Vanilla aromatica*), the Cocoa (*Theobroma cacao*), the Coca (*Erythroxylon coca*), the Mangosteen (*Garcinia mangostana*), the Durian (*Durio zibethinus*), the Bread Fruit (*Artocarpus incisa*), &c., which require some more degrees of heat and moisture to bring them to perfection than can be had at Cardwell. In fact, with the vast variety of climate and soil of Queensland, it must of necessity be the case that each locality has a distinct description of vegetation most suited to it."

With regard to the ascent of Bellenden Kerr, we are told that the first two miles of the course led through low ground, which, after much wet weather, must become a swamp. The vegetation consisted of *Barringtonia carya*, F. Muell., *Ptychosperma alexandriae*, F. Muell., *Calamus australis*, Mart. (Lawyer Cane), *Bambusa arundinacea*, Retz., *Pandanus aquaticus*, F. Muell.; whilst on the higher portion of the ground were *Wormia alata*, R.Br., *Dysoxylon oppositifolium*, F. Muell., *Aglaia elaeagnoides*, Benth., lawyer cane, bamboo, screw pines, &c. A fine watercourse was here crossed, which was referred to as the Bellenden River. Along the banks of this river the trees consisted of the genera *Castanospermum*, *Eugenia*, *Brucea*, *Ximenia*, *Elaeocarpus*, *Owenia*, &c. The soil on both sides was of a sandy nature, with a good admixture of vegetable matter. It took about three hours to reach this place, the distance of which was calculated at about three miles from the point of departure, and having risen, according to the aneroid, to an elevation of 160 ft. Having found a spur, four hours and a half were consumed in covering a distance of one mile and a half, through a complete mass of bamboos, lawyers, and screw pines, where the exploring party camped for the night on a small incline between two ridges, at an elevation of only 1,250 ft. The trees in this neighbourhood consisted of *Erioglossum edule*, Bl., *Cupania Robertsonii*, F. Muell., *Atalaya salicifolia*, Bl., *Harpullia Leichardtii*, F. Muell., *Castanospermum australe*, A. Cunn., *Minusops parvifolia*, R.Br., *Achras pohlmanniana*, F. Muell. The thic